

Sub.Code : 2021'E'

NEB - GRADE XII

2081 (2024)

Biology

(New Course)

(For regular and grade increment students whose first two digits of registration number starts from 78, 79 and 80)

Please complete first section I (Botany) and then section II (Zoology).
Answer of each section should separate in the same answer sheet.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Time: 3 hrs.

Full Marks: 75

Group 'A' (Botany and Zoology)

Multiple Choice Questions No. 1 to 6 (Group A Botany) and Question No 12 to 17 (Group A Zoology) will be provided after 30 minutes of starting examination. Rewrite its (MCQ) correct options (answer) in your same answer sheet.

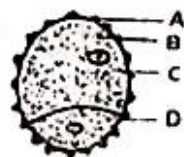
Section : I (Botany)

Group 'B'

Short answers questions.

[4×4=16]

6. Define parenchyma tissue and explain its structure and function. [1+2+1]
7. Observe the diagram of a pollen grain and answer the questions given below.
 - i) When is the pollen grain produced in a flower? [1]
 - ii) Identify the parts A and C. [1]
 - iii) In angiosperms, the pollen grain germinates to produce pollen tube that carries two male gametes. What is the purpose of carrying two male gametes when single gamete can fertilize the egg? [2]
8. Explain the mechanism of incomplete dominance up to F_2 generation with suitable example. How does it differ from complete dominance? [2+2]



OR

Describe any four practical importance of seed dormancy in agriculture and horticulture. [2+2]

9. Describe the process of micro propagation to rapidly produce large number of identical plantlets and describe how it can be used in conservation efforts for endangered plant species. [2+2]

(Contd...)

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2081 (2024)

Biology

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Multiple Choice Questions

Rewrite the correct option of each question in your same answer sheet.

Section : I (Botany)

Group 'A'

[5×1=5]

1. What is called the development of fruit without fertilization ?
A) Parthenocarpy
B) Apomixes
C) Polyspory
D) Parthenogenesis
2. What is the name of the process by which turgidity of a cell is maintained ?
A) Wall pressure
B) Osmotic pressure
C) Diffusion pressure
D) Turgor pressure
3. A heterozygous individual with the genotype Aa Bb is crossed with another heterozygous individual with the genotype Aa Bb. What is the probability of their offspring inheriting the recessive alleles for both traits ?
A) $\frac{1}{4}$
B) $\frac{1}{8}$
C) $\frac{1}{16}$
D) $\frac{1}{32}$
4. What is the name of the lateral meristem responsible for secondary growth in stems ?
A) Apical meristem
B) Vascular cambium
C) Cork cambium
D) Periderm
5. Which experimental result provides the strongest evidence for the involvement of auxin in root development ?
A) High auxin concentration inhibits root growth
B) Low auxin concentration stimulates root growth
C) High auxin concentration stimulates shoot growth
D) Low auxin concentration inhibits shoot growth

(Contd...)

Section : II (Zoology)

Group 'A'

[6×1=6]

12. Which pair of white blood cells contains phagocytic cells ?
A) Monocytes and eosinophils B) Monocytes and neutrophils
C) Eosinophils and basophils D) Monocytes and lymphocytes
13. What happens during spermeiogenesis in the process of spermatogenesis ?
A) Primary spermatocytes are formed from spermatogonia
B) Secondary spermatocytes are formed from primary spermatocytes
C) Spermatids are formed from secondary spermatozoa
D) Spermatozoa are formed from spermatids
14. Show the correct path of origin and conduction of heart beat in human heart.
A) Av-node, SA-node, bundle of His, Purkinje fibres
B) SA-node, Av-node, bundle of His, Purkinje fibres
C) SA-node, Av-node, Purkinje fibres, bundle of His
D) Av-node, bundle of His, Purkinje fibres, SA-node
15. Which enzymes are likely to act orderly on soyabean sprouts eaten by man as it moves down the alimentary canal ?
A) Pepsin, trypsin, peptidases B) Trypsin, peptidases, pepsin
C) Pepsin, peptidases, trypsin D) Peptidases, pepsin, trypsin
16. The cerebral cortex of human forebrain contains many functional areas. What would happen, if the frontal lobe of cerebrum is accidentally damaged ?
A) Loss of vision and hearing
B) Impaired respiration and circulation
C) Impaired water balance and hunger
D) Loss of memory and learning
17. What is the primary role of surrogate mother in the context of IVF ?
A) To ensure successful fertilization
B) To provide emotional support to biological mother
C) To carry the pregnancy to full term
D) To donate ova

Group 'C'**Long answers questions.**

[2×8=16]

10. The light-independent reactions of photosynthesis involve the conversion of carbon dioxide into glucose. Explain the steps involved in this process and how the products of the light dependent reactions (ATP and NADPH) are utilized. [5+3]
11. In what ways does DNA serve as genetic material of living organisms, and discuss its double helical structure with labelled diagram. Analyze the similarities and differences between DNA and RNA, and evaluate the significance of these molecules in genetic processes. [1+4+2+1]

OR

How can chromosomal mutations alter the number and structure of chromosomes ? Provide a detailed discussion on the various types of chromosomal mutations. Analyze the significance of chromosomal mutation in an organism. [1+4+3]

Section : II (Zoology)**Group 'B'****Short answers questions.**

[4×4=16]

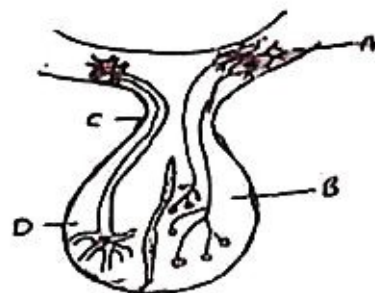
18. Compare and contrast between voluntary and involuntary muscles. [2+2]
19. What is coelom ? How is it formed in frog's development ? [1+3]

OR

What are pullets ? How would you express the scope of poultry in Nepal ? [1+3]

20. Study the given figure and answer the following questions.

- i) Label the part A and B [1]
- ii) Name two hormones released from part B. [1]
- iii) Which hormone is called birth hormone and why ? [2]



21. Taking drugs for a non medical purpose causes its addiction. In your view, what motivates youngsters to take drugs and how can this be prevented ? [4]

(Contd...)

CHHOREPATAN SECONDARY SCHOOL
FIRST TERMINAL EXAMINATION 2081

Time: 3hrs

F.M.: 75

Grade: 12

Subject: Biology (2021)

Part A: Botany

Multiple choice questions

[5*1=5]

1. A tissue that contains lignin is
 a. Parenchyma b. Collenchyma c. Chlorenchyma d. Sclerenchyma
2. What is true about a monocot leaf?
 a. Unequal distribution of stomata
 b. Absence of bulliform cells from epidermis
 c. Mesophyll not differentiated into palisade and spongy tissues
 d. Well differentiated mesophyll

3. Match the following

Column A	Column B
A. Cyclic electron flow	i. Produces both ATP and NADPH
B. Non-cyclic electron flow	ii. Involves only photosystem I
C. C4 pathway	iii. First stable product is oxaloacetate
D. C3 pathway	iv. First stable product is Phospho glyceric acid

- a. A-i, B-ii, C-iii, D-iv b. A-ii, B-i, C-iii, d-iv
 c. A-ii, B-i, C-iv, D-iii d. a-i, B-ii, C-iv, D-iii
4. With an increase in the turgidity of a cell, the wall pressure will
 a. Fluctuate b. remain unchanged c. increase d. decrease
5. What is the path of ascent of sap
 a. Xylem b. phloem c. parenchyma d. collenchyma

Short questions

[4*4=16]

6. Define diffusion. Write the significance of diffusion.
 OR

Describe the types of osmosis.

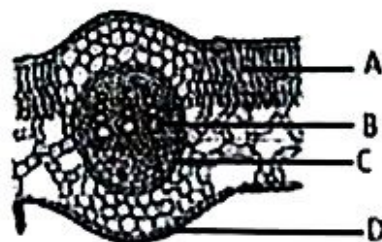
7. Write any four differences between transpiration and guttation.

8. Write short note on annual rings

9. Answer the following questions on the basis of given diagram.

a. Identify A, B, C and D.

b. Write the function of C and D.



Long question

[2*8=16]

10. Discuss secondary growth in dicot stem with well labelled diagram.

OR

What do you understand by secondary phase of Photosynthesis? Describe the process of Calvin cycle.

11. What is Respiration? Describe Krebs cycle in detail.

Part B: (Zoology)

Multiple choice questions:

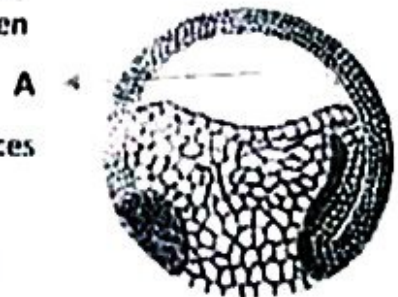
[1*6=6]

1. Which of the following fibers are present abundantly in tendon?
a) Yellow elastic b) White collagen c) Myofibril d) Reticulin
2. Which one of the following stages has blastopore?
a) Morula b) Blastula c) Gastrula d) Zygote
3. The pacemaker of myogenic heart is:
a) A-V Node b) Tricuspid Valve c) Bicuspid Valve d) S-A Node
4. The respiratory center that controls the breathing is found in:
a) Cerebrum b) Medulla Oblongata c) Cerebellum d) Spinal Cord
5. The chylomicrons the soluble form of fats contain:
a) Sugar, Protein and Fatty acids
b) Glycerol, Fatty acids and Bile salts
c) Monoglycerides, Lipo-proteins and Fatty acids
d) Cholesterol, Fatty acids and Bile salts
6. If the body doesn't secrete enterokinase, the digestion of food affected is:
a) Carbohydrates b) Albumen c) Fat d) Amino acid

Short answer questions:

[4*4=16]

6. Which stage of embryology of Frog is shown in the given figure? Name the cavity 'A'. Explain the process of formation of this stage. [0.5+0.5+3]
7. What is coronary circulation? Write down the differences between arteries and veins.
8. Distinguish between bone and cartilage.
9. Describe the role of stomach and small intestine in the digestion of food.



OR,

Draw a well labelled diagram of Human elementary canal and mention any four functions of liver. [2+2]

Long answer question.

[8*2=16]

10. Define connective tissue. Describe the location, structure and function of Areolar tissue with necessary diagram. [1+7]
11. What is heartbeat? Explain the origin and conduction of heartbeat with essential diagram. [1+7]

OR,

Explain the physiology of respiration with essential diagram.

BEST OF LUCK

III. Answer in detail.

[2×8=16]

- 10) In which step of respiration, pyruvic acid is completely oxidized into CO_2 and H_2O ? Describe it in detail with necessary chart.
- 11) Describe the double helical structure of Watson and Crick's model of DNA with the help of a neat and labelled diagram.

Or,

Or,
Why does red-green colour blindness occur more in males than in females and which kind of genetic inheritance is involved? Briefly describe it with illustrations and draw conclusion. [3+5] [38]

[3+5]

[38]

Zoology

[6×1=6]

1. Rewrite the best option.

- 1) Digestion of protein gives:
 - a) Amino acid
 - b) Carbohydrate
 - c) Ester
 - d) Fat
- 2) Areolar tissue connects:
 - a) Muscle to bone
 - b) Bone to bone
 - c) Integuments with muscle
 - d) Fat with bone
- 3) Which of the following is a characteristic feature of skeletal muscle tissue?
 - a) Multinucleated cells
 - b) With intercalated discs
 - c) Spindle-shaped cells
 - d) Involuntary control
- 4) If a doctor gives his blood immediately without a blood test to the patient in an emergency, then the blood group of the doctor is:
 - a) Golden blood group
 - b) A blood group
 - c) O blood group
 - d) AB blood group
- 5) Which of the following is a conductive tissue?
 - a) Epithelial tissue
 - b) Connective tissue
 - c) Muscular tissue
 - d) Nervous tissue
- 6) The partial pressure of oxygen in deoxygenated blood is about
 - a) 60 mmHg
 - b) 40 mmHg
 - c) 44 mmHg
 - d) 100 mmHg

II. Answer in brief.

[4×4=16]

- 7) What is a synapse? Differentiate between axon and dendron.
- 8) Draw a well-labeled diagram of the human respiratory system.
- 9) Enlist the functions of the liver.

Or,

What are the different types of salivary glands found in humans? Describe in brief their structures and functions.

- 10) Explain how carbon dioxide is transported by blood.**

III. Answer in detail

[2×8=16]

- 11) Draw a well-labeled diagram of the alimentary canal of man. Explain the process of gastric digestion in human beings. [4+4]

[4+4]

Or,

Describe the mechanism of pulmonary ventilation in humans.

- 12) Describe the internal structure and workings of the human heart with a suitable diagram. [8]

[8]

d) Adsorption

Group 'B'

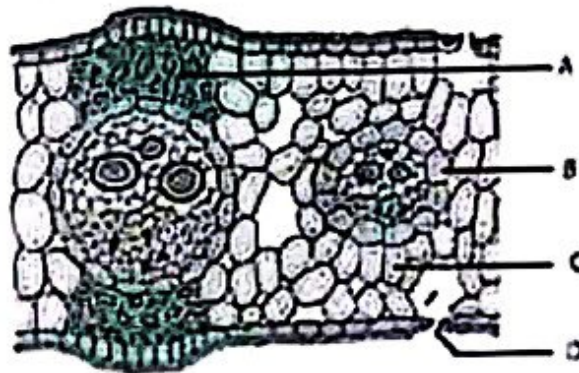
Give short answers to the following questions. [4 × 4 = 16]

6. What do you mean by simple tissue? Describe the types of Parenchyma as simple tissue with necessary diagrams. [1 + 3]
7. Define diffusion. Discuss the process of diffusion with suitable example. [1 + 3]

OR

What is meristem? Describe the types of meristematic tissues on the basis of their position in plant body. [1 + 3]

8. Explain the experiment on osmosis by potato osmoscope method. [4]
9. Identify the given diagram. Label the part A to D. Give its identifying characters. [1 + 1 + 2]



Group 'C'

Give long answers to the following questions. [2 × 8 = 16]

10. What is ascent of sap? Describe the mechanism of ascent of sap as given by Dixon with supporting diagrams. [1 + 4 + 3]

OR

Elaborate the term Photosynthesis and give its balanced chemical equation. Discuss the light reaction with suitable diagram [2 + 6]

11. Describe the anatomical structure of dicot stem with necessary diagrams. Differentiate it from monocot stem with reference to their vascular tissue system. [5 + 3]

Section: II (Zoology)

Group 'A'

Rewrite the correct option of each question in your answer sheet. **[6 × 1 = 6]**

12. Malpighian body is situated in

- a) Renal cortex
- b) Renal pyramids
- c) Renal pelvis
- d) Renal medulla

13. The sensory fibres and motor fibres arise from _____ nerve

- a) Vestibulo-cochlear
- b) Optic
- c) Trigeminal
- d) Hypoglossal

14. During fusion of sperms and ova, penetration path is formed in

- a) Albuminous coat
- b) Fertilization membrane
- c) Animal hemisphere
- d) Vegetal hemisphere

15. Canal of Schlemm is present between

- a) Sclera and Cornea
- b) Sclera and Choroid
- c) Choroid and Retina
- d) Lens and Retina

16. Oxygenated blood passes through

- a) Right atrium → Right ventricle → Aorta
- b) Left atrium → Left ventricle → Aorta
- c) Right atrium → Left ventricle → Pulmonary trunk
- d) Left atrium → Left ventricle → Pulmonary trunk

17. In the process of deamination _____ is released

- a) Glucose
- b) Amino acids
- c) Urea
- d) Ammonia

Group 'B'

Give short answers to the following questions. [4 × 4 = 16]

18. What is neurulation? Explain the process of neurulation of frog.

[1 + 3]

19. Describe the structure and functions of any heterocrine gland you have studied. [4]

20. Compare and contrast between myelinated and non-myelinated neurons. [2 + 2]

21. Differentiate between hypertension and hypotension. Give a brief note on human blood pressure. [1 + 3]

OR

What is erythroblastosis foetalis? Elaborate on this condition.

[1 + 3]

Group 'C'

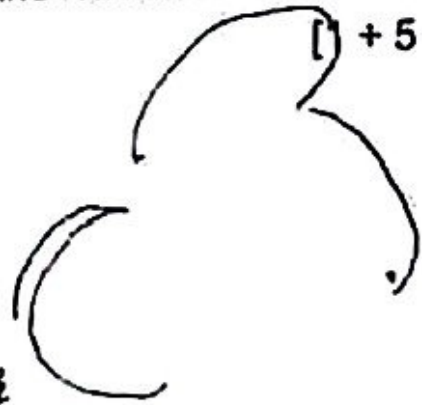
Give long answers to the following questions. [2 × 8 = 16]

22. Brain receives all the sensations from different receptors. Discuss the process of transmission of these sensations between receptors and brain along and between the neurons. [5 + 3]

23. A central pumping organ contracts and relaxes to make the blood flow throughout the body. Identify this organ and explain the structure of this organ with well-labelled diagrams. [1 + 4 + 3]

OR

What is dental formula? Describe the structure of alimentary canal with a well-labelled diagram. [1 + 5 + 2]



Best of Luck

**NEB- GRADE XII
2079 (2022)**

**Biology
New course**

For regular students (Except technical stream students)

Please complete at first section I (Botany) then section II (Zoology).
Answer of each section should be separate in the same answer sheet.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Time: 3 hrs.

Full Marks: 75

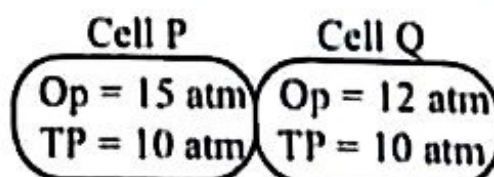
Attempt all the questions.

**Section : I (Botany)
Group 'A'**

5×1=5

Rewrite the correct options of each questions in your answer sheet.

1. In a monohybrid cross of two heterozygous parents (Rr), what would the expected genotypes of the offsprings be ?
 A) 1 Rr : 2Rr:1rr B) 1rr:3RR
 C) 3Rr:1rr D) All Rr
2. Which of the following cells in an embryo sac degenerate after fertilization?
 A) Synergids and primary endosperm cell
 B) Synergids and antipodal cells
 C) Antipodal cells and primary endosperm cell
 D) Eggs and antipodal cells
3. Two cells P and Q are in contact with one another but are separated by the semi-permeable membrane as shown in the diagram. The osmotic pressure of cell P is 15 atm. and that of Q 12 atm. The turgor pressure of cell P is 10 atm. and that of Q is 6 atm. In which direction will the water move ?
 A) From cell P to cell Q
 B) From cell Q to cell P
 C) There will no movement of water
 D) Water can move either from cell P to Q or from cell Q to P



4. Which one of the following parenchyma cells makes the aquatic plants light and helps in buoyant ?
 A) Prosenchyma
 C) Aerenchyma
 B) Assimilatory parenchyma
 D) Stellate parenchyma
5. In an economically important plant species, embryo mortality is very high. What method do you suggest to check the mortality ?
 A) Micropropagation
 B) Polyploid mutation
 C) Embryo culture
 D) Meristem culture

Group 'B'

Give short answer to the following questions.

4x4=16

6. 'Meristem is also known as Juvenile tissue'. Justify. Explain the types of meristem on the basis of position. 1+3
7. What are the differences between transpiration and guttation ? 4

OR

Explain in brief about significance of polyploidy with examples.

8. Write the salient features of dicot embryo in reference to its development pattern with labelled diagrams. 2+2
9. 'Hybridisation is a modern breeding method for the development of crop plants with desired characters as well as hybrid vigour'. Justify this statement by describing various steps of hybridisation procedure in plants. 1+3

Group 'C'

Give long answers to the following questions.

2x8=16

10. Mutation is important from the evolutionary point of view. Give reasons. How does gene mutation occur ? Explain its types. 2+2+4

OR

Why is *Drosophila melanogaster* selected for genetical study ? 'The inheritance of sex-linked trait follows criss-cross pattern of inheritance'. Justify this statement by describing with special reference to eye colour of *Drosophila*. 3+5

11. The source of oxygen in photosynthesis is the water but not the carbon dioxide. Explain with reasons. Briefly describe the Hill reaction. 2+6

Section : II (Zoology)

(Contd...)

Group 'A'

Rewrite the correct options of each questions in your answer sheet. 6x1=6

12. Which of the following tissues possess fat globules ?
A) Areolar tissue
B) Adipose tissue
C) Blood plasma
D) Striped muscle
13. What are the sequential steps involved in process of gametogenesis ?
A) Multiplication, growth, maturation
B) Multiplication, maturation, growth
C) Growth, multiplication, maturation
D) Maturation, growth, multiplication
14. When an organ transplantation occurs between two genetically identical individuals, what will be the type of transplantation among following ?
A) Auto graft
B) Allograft
C) Heterograft
D) Iso graft
15. Over population causes adverse consequences in the society. Highlight which of the following can control over population ?
A) Early marriage
B) Polygamy
C) Family planning
D) Food supply
16. In the middle ear of human being, there are three ear-ossicles. Identify and select which of the following ear-ossicles are arranged in correct sequence ?
A) Malleus, Incus, Stapes
B) Malleus, Stapes, Incus
C) Cochlea, Incus, Malleus
D) Malleus, Incus, Sacculle
17. Pancreas is a gland having exocrine and endocrine in functions. Its exocrine part is the pancreatic acini. What would be the endocrine part ?
A) Zona glomerulosa
B) Islet of Langerhans
C) Zona reticularis
D) Adenohypophysis

(Contd...)

2021 'N'

(4)
Group 'B'

Short answer questions.

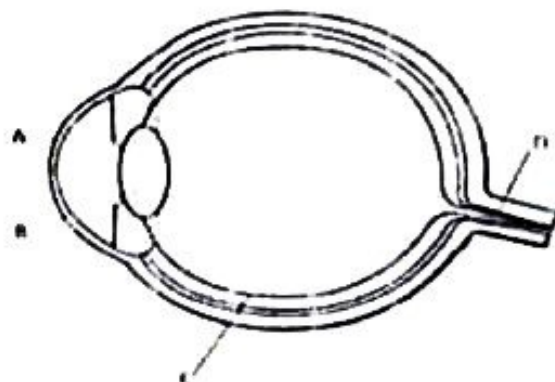
4x4=16

18. How would you elaborate the different types of simple epithelial tissues in animals ? Support with diagrams. 3+1
19. Describe the process of oogenesis in animals with diagram. 3+1

OR

Define the term *in-vitro* fertilization. Describe its process.

20. Study the given diagram of V.S. of human eye and answer the following questions. 2+2



- a) Label A, B, C, and D
- b) Write one function each of the part labelled.
21. Kidneys are the organs which filter the blood to remove the wastes and keep the electrolyte in balance. If the kidneys do not function normally, various renal disorders are observed. Highlight any two common renal disorders in human beings. 4

Group 'C'

Long answer questions.

2x8=16

22. Explain cholera as an acute diarrhoeal disease. Discuss its causative agent, mode of transmission and symptoms. Mention its control measures. 1+1+2+2+2
23. Draw a labelled diagram of alimentary canal of a human being. How would you explain the digestion of proteins in gut ? Justify the relationship between amylase and lipase enzymes in digestion of food. 3+4+1

OR

Justify the statement "sino-auricular node is a natural pacemaker." What would you suggest if the natural pacemaker does not function normally ? How do you test blood grouping in human beings ? 3+2+3